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A NOVEMBER NOSEGAY.

ARE they weeds or are they flowers? It might indeed be difficult to make a presentable nosegay out of the subjects of this paper, but there are few flowers left in this cold north country of ours, and hips and haws, together with bright holly berries, are the chief ornaments of our lanes and copses, so that an interesting plant or two, a bit of untilled garden ground must in default of better be laid under contribution for a November nosegay.

Campanula Rapunculoides—Creeping Campanula, and well it deserves its name, is a troublesome weed in our garden where it has become established under the gooseberry bushes, and by means of its creeping roots quickly spreads over an ever-increasing surface of ground. The fork disclosed a perfect forest of tubers, some of them of large size and shaped like a carrot, often forking, too, like a carrot does where the ground has been ill-prepared. Buds are formed upon the surface of the tubers, and also at many points of the creeping stem where tubers do not as yet exist. The tubers are subterranean branches arrested in growth and enlarged by the deposition of starch, their stem-like nature being indicated by the possession of buds or eyes as in the petals, and the scale-like leaves seen in the long creeping stem show that it is not a *root* as might at first sight be imagined, but an underground stem. Nourishment has been stored up in the tubers during the summer season for use next spring in enabling the dormant buds to make vigorous growth and further extend the land to be possessed by the plant. Even were no seed ripened during an unfavourable season, such a plant as this would not greatly suffer. The Campanula, or Bell family, so named from its bell-shaped corolla is placed in our flora between the natural orders *Compositae* and *Ericaceae*. If we tear open the flower of a Heath or Campanula we find that the stamens are within the base of the corolla and not upon its tube, and this insertion of the stamens distinguishes *Campanulaceae* and *Ericaceae* from all other British monopetals, the number of stamens in the Campanula being always the same as the lobes of the corolla. This family is interesting

also from the fact that the flowers are *proterandrous*, stamens ripening before the pistil, and being thus absolutely dependent for the production of seed upon the visits of insects, we may expect to find them honeyed, as indeed they are. The different appearance of the interior of a Campanula at different stages of its development is familiar to all who have even casually examined the flowers of any of the species. When the valves first open they disclose both stamens and pistil in very close association, the tip of the pistil appearing above the anthers like that of a dandelion when it first pushes its way upwards through its tube of united anthers, but if we take any older flower, or the stem, we find that the pistil has apparently risen above the anthers, its hairy style thickly covered with pollen, and that its tip has expanded into three lobes that turn backwards and spread out their matured stigmatic surfaces, while the empty anthers are shrivelled up at the base of the flower. The hairs of the style do not brush the pollen out of the anthers as in the Compositae, but just receive it as it is shed upon them, for the style really elongates very little, if at all, and the shrinking back of the stamens is all that is needed to expose the pollen. In many unopened flowers the anthers are found to be already dehiscing, and the closed corolla of course prevents the access of insects, but this may not always be the case, because in autumn when external conditions are not so favourable, flowers sometimes depart from their ordinary methods.

We see, however, by the maturing of the stamens before the pistil, that the arrangement is to ensure cross fertilization through the agency of insects, but as plants would seem to know, there are insects, and insects! Some are useless to the plant, possibly because too small for its purposes, but large or small, cringed or creeping, it is absolutely necessary that they should enter the flower in a particular manner if their presence is to be beneficial. Bearing this in mind it is not a little interesting to note the various barriers placed by this special Campanula against the intrusion of useless, or, as Kerne puts it, unbidden guests. In the first place it is said that no flowers present such difficulty to small wingless animals as do the pendulous; no ant, for instance, can get inside a snowdrop, but our Campanula not being absolutely pendulous it cannot afford to be quite so smooth externally as the snowdrop, and we find its calyx rough with hairs turned backwards like so many spear points to warn off intruders. But supposing an insect to have braved this danger and to have reached the edge of the corolla, he will here find delicate hairs scattered on its margin; but if in earnest to reach the honey that his instinct assures him will reward his perseverance, we cannot say that these hairs will form an insurmountable barrier! Once fairly within the bell he hurries down to the base only to find a far more formidable *chevaux de frise* barring his progress. If a drawing of one of the stamens, also a section of a flower could be shown here, it would be seen that the base of the filament is flattened and dilated, the part above it being bent in like a knee, and this shape results in the formation of a hollow cone which domes in the nectariferous disk, and as the margins of the filaments are thickly set with long hairs that interlace with their neighbours, our little visitor can gain no access through their interstices, If he is to reach the honey at all, he must surmount the filaments and find the only possible way into the domed nectar which lies in a narrow passage between the filaments and the style in the very centre of the flower, so that eventually he reaches after his wanderings the self-same entrance to which the humble bee directs his flight at first, and holding on to the pistil gets well dusted with the pollen that lies so thickly on its hairy style, his proboscis being inserted meanwhile through the opening that seems made on purpose for such welcome guests as he! There is another Campanula called *C. barbata*, in which the thin twisting hairs at the edge of the bell close it in with a sort of lattice work, and serve as a bridge to conduct insects from the edge of the flower to their proper descent by the stigmas. but our species is not so accommodating. The three-celled subglobose capsule of *C. rapunculoides* dehisces by means of three pores or valves at its base, and while the fruit is unripe they show as deep pits or depressions. As the capsule matures a process called rupturing takes place, the effect of which is to form pores in the depressions. The calyx in the Campanula family is adherent to the ovary, the top of which is crowned by its lobes, and the pores penetrate through the walls of the pericarp formed by the adherent calyx and ovary. It is interesting to find that at an early stage the ovules are enclosed in a white bag or skin, quite distinct from

the walls of the pericarp. The conclusion seems to be that the white bag of the early stage is the ovary proper, which, as it grows larger to accommodate the swelling seeds, finally unites with the calyx tube, because in the ripe capsule it appears as a lining to the pericarp. May this be an illustration in a dry fruit of the adhesion or cohesion that takes place in the succulent fruit of the apple between the calyx tube and the ovary, and may the delicate white bag represent that line in the apple which is supposed to mark the place of union between the carpels and the swollen calyx tube.

The next flower in our nosegay is *Fumaria officinalis*, the common Fumitory. It ramps all over a low laurel fence, on the edge of a wall, and with this support continues to grow to a considerable height. The leaves are much cut and divided, and it is by means of their twisted petioles that it climbs so high, for it is a weak plant by nature, and is unable to stand alone. It is of a pretty pale green and the flowers grow in racemes opposite to the leaves, or are sometimes terminal. It is in the flowers themselves that the great interest of the plant lies, so we will examine one of them. The petal is short with a single colourless bract at its base; the two sepals are also colourless and toothed at their edges, they look like wings to the flower. The plan of the flower is cruciform. The petals are four in number, two inner and two outer. The upper of the two outer ones is prolonged at the base into a pouch-like spur, the lower is opposite to it and both close over the inner petals, which are seen protruding slightly between them. On removing the outside petals we find that the inner two are placed exactly crosswise to them, and that their tips are united.

By turning the flower slightly, the shape of the inner petals is seen and also the upper stamen that lies between them with its broad dilated base and the spur, which was previously hidden in the pouch of the upper petal, We now remove the two remaining petals and find that their united tips form a hollow chamber in which are concealed the anthers and stigmas of the flower. It need scarcely be said that the condition in which these are found will vary according to the age of the flower, and in such a one as is under examination, the chamber will be full of pollen, masses of which adhere to the curiously shaped stigma. In order to see the appearance of the stamens and pistil before the former have shed their pollen, we must get a flower that has scarcely passed the condition of a bud. In working backwards, that is from the base to the tips, along a whole raceme, every flower was found in the condition described above, and it was not until an inflorescence was chosen, which had scarcely begun to elongate, that the stamens were discovered intact and even here the anthers had begun to dehisce though the pollen was for the most part retained in their cells.

The anthers were bursting outwardly, but even while looking they slip away from the two-horned stigmas and sink down, as is their wont when they have begun to shed their pollen. It must be explained that the flower has six stamens united into threes, the filaments being dilated at the base so as to form a covering to the ovary. The anthers are free and have this peculiarity, that the centre one of each group has two cells, while the outer ones have only one. Each horn of the stigma is clasped as it were on either side by the one-celled anthers, while the two-celled central anther occupies a position at its extreme tip. The stigma seems admirably adapted for *hooking* off the pollen so to speak, the curious and lovely pollen shaped like a sphere, with four smaller crystalline spheres upon its surface. But does the stigma hook it off? This can scarcely be the case, for the anthers, as we see, open outwards. Why? Müller says that the flowers of the *Fumitory* are usually self-fertilized, and indeed the pistil and stamens are so closely shut up together in the little ruby box formed by the petal tips, that one cannot see how it could well be otherwise. But then, why that spurred upper stamen, the spur a nectary too, inclosed in the inflated spur of the petal? Surely insects might have been expected to come to the aid of a flower that has evidently prepared for their reception, if it had not peevishly denied them access to the feast and at the last minute shut the door in their faces! But is it so? Why make honey if no one is to eat it? Why arrange to shed the pollen *away* from the pistil, and then contrive that somehow or other it shall get on to it? Perverse little flower! and yet after all, a little longer patient study might explain its seeming contradictions, and we need not upbraid it because unable at once to penetrate the secrets of its mysterious being.

READING AND RECITATION.

PART IV.

BY T. G. ROOPER, H.M.I.

(Concluded from page 715.)

AGAIN I refer you, for the analysis of the treatment of this poem, to Mr. Burrell. He gives useful hints for assisting scholars to improve their memories by framing associative links between words and thoughts from line to line, and also for cultivating the child's natural power of making the inflection of his voice correspond with his thought.

Looking to the needs of children over ten years, I incline to think narrative poetry, and especially ballads, are most suitable. There is a prevalent tendency to select sentimental pieces, and often rather mawkish sentiment. Lyric poetry seems to me seldom suitable for children. It is of the essence of lyric poetry that the subject and thoughts be closely connected with the experience and personal feeling of the writer. Adults enjoy the intimate union with the poet's mind, which the self-revelation of the lyric poet makes possible. But the thoughts of men are not the thoughts of children, even when they seem simple. Here, for instance, is a beautiful lyric appropriate to June, the month of haymaking, by Andrew Lang, which delights a man but wants the joyous confidence which is right and healthy in a child, if he be sound in mind and body:—

SCYTHE SONG.

"Mowers weary and brown and blithe,
What is the word methinks ye know,
Endless over-word that the Scythe
Sings to the blades of the grass below?
Scythes that swing in the grass and clover,
Something still they say as they pass;
What is the word that over and over
Sings the Scythe to the flowers and grass?
Hush, ah hush, the Scythes are saying,
Hush and heed not and fall asleep;
Hush, they say to the grasses swaying,
Hush, they sing to the clover deep;